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SHANGHAI ELECNOVA ENERGY STORAGE CO., LTD.

ENERGY STORAGE SYSTEM



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Elecnova Energy Storage

ABOUT US

As a scientific and technological innovation enterprise, Shanghai Elecnova Energy Storage Co., Ltd. specializes in ESS integration and support capabilities including PACK, PCS, BMS and EMS.

Adhering to the values of products as the core and the quality as the cornerstone, Elecnova is committed to meeting the diversified needs of market segments and customers, dedicated to providing excellent customized solutions and services for various application scenarios on the sides of generation, grid and end users.



Corporate Vision

- Build Elecnova as a top expert in energy storage solutions



Enterprise Spirit

- Unity in a concerted effort
- Honesty
- Intelligence, innovation
- Scientific development

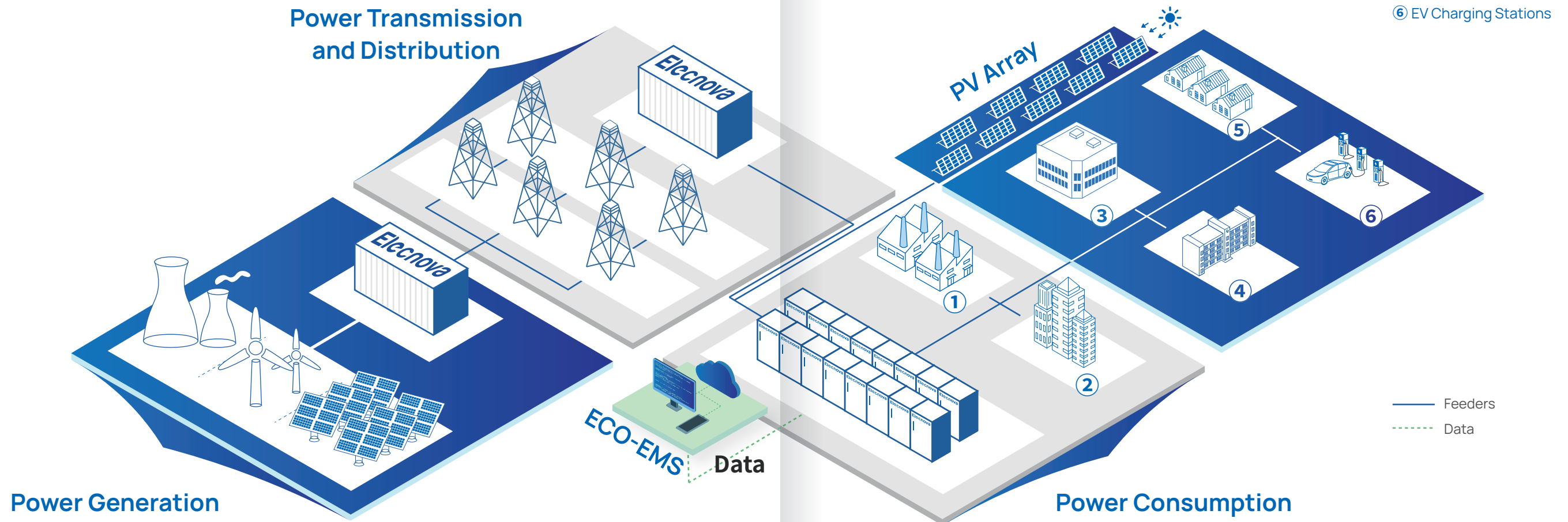


Core Values

- Create value for customers
- Share value with employees
- Contribute value to community

ESS Scenarios

Provide one-stop industrial and commercial distributed energy storage battery system solutions with high safety, high reliability, high efficiency and long cycle life.



- ① Industrial Parks
- ② Commercial Buildings
- ③ Data Centres
- ④ Utility Facilities
- ⑤ Dwellings
- ⑥ EV Charging Stations

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Energy Arbitrage
- 

Power Quality Optimisation
- 

Decarbonisation Promotion
- 

Power Market Ancillary Services
- 

Backup Power Supply

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All-in-one Air-cooled ESS Cabinet

ECO-E215WS

Brief

The all-in-one air-cooled ESS cabinet integrates long-life battery, efficient bidirectional-balancing BMS, high-performance PCS, active safety system, smart distribution and HVAC into one cabinet, enabling long-term operation with safety, stability and reliability. Through AC side parallel connection, it achieves agile deployment of ESS power station with flexible capacity expansion.



Features

Economical and Efficient
Conversion efficiency over 90%,
DoD over 95%.

Safe & Reliable
IP55 protection level, optimized ventilation design,
cells temperature difference within 5°C.

Compact
1.6m² footprint only,
easy transportation & fast installation.

Self-developed
Self-developed PACK, PCS, BMS and EMS with good
product compatibility.

Flexible Expansion
Modular design, simplified parallel expansion,
fast expansion.

Smart O&M
Diversified O&M access, both on APP & Cloud.

Specifications

DC Part	
Cell Type	LFP 3.2V/280Ah
PACK	17.92kWh/1P20S
Battery System	215kWh/1P240S
Voltage Range	672~864Vdc
Rated Voltage	768Vdc
AC Part	
Rated Power	100kW
Max. Power	110kW (60s)
THDi	<3%
DC Ratio	<0.5%lpn
Nominal Voltage	400Vac
Power Factor	-1 lagging~1 leading
Nominal Frequency	50/60 Hz
General	
Efficiency	≥90%
Charge/Discharge Rate	≤0.5P
DoD	95%
Cycle Life	≥8,000 times
Switching Time	<100ms
Connectivity	Ethernet /RS485
Ingress Rating	IP55
Cooling	Forced Air Cooling
Operating Temperature	-25°C~55°C
Humidity	0-95%RH, non-condensing
Noise	≤75dB
Altitude	≤2,000m (derating above 2,000m)
Fire Safety	Aerosol + Active Warning
Dimensions (W*D*H)	1,250*1,300*2,400 (mm)
Weight	2,500kg
Compliance	UN38.3, IEC61619, UL1973, UL9540 and CE-EMC

All-in-one Liquid-cooled ESS Cabinet

ECO-E233LS

Brief

The all-in-one liquid-cooled ESS cabinet adopts advanced cabinet-level liquid cooling and temperature balancing strategy. The cell temperature difference is less than 3°C, which further improves the consistency of cell temperature and extends the battery life. The modular design makes the parallel solution more flexible and has higher energy density, which significantly improves the economy, safety and construction convenience of ESS projects.



Features

Compact
1.4m² footprint only, save 35% space compared with air-cooled.

High Power Density
233kWh energy in one cabinet and ensure long-term endurance.

Efficient
Optimal in-PACK duct design, achieve high-efficient cooling and low energy consumption.

Long Cycle Life
Over 8,000 times cycle life, excellent performance of battery system.

Flexible Expansion
Modular design, simplified parallel expansion.

Ultimate Safety
In-PACK and triple-level fire safety, prevent heat runaway.

Specifications

DC Part	
Cell Type	LFP 3.2V/280Ah
PACK	46.6kWh/1P52S
Battery System	233kWh/1P260S
Voltage Range	728~936Vdc
PACK Ingress Rating	IP65
AC Part	
Rated Power	100kW
Max. Power	110kW
THDi	<3%
DC Ratio	<0.5%lpn
Nominal Voltage	400Vac
Power Factor	-1 lagging~1 leading
Nominal Frequency	50/60 Hz
General	
System Efficiency	≥91%
Charge/Discharge Rate	≤0.5P
DoD	95%
SOC Accuracy	<3%
Cycle Life	≥8,000 times
Switching Time	<100ms
Connectivity	Ethernet /RS485
Ingress Rating	IP55
Cooling	Liquid Cooling
Operating Temperature	-25°C~55°C
Humidity	5-95%RH, non-condensing
Noise	≤75dB
Altitude	≤2,000m (derating above 2,000m)
Fire Safety	Combustible gas detection/smoke detection/temperature detection + active warning + module-level fire suppression (Perfluoro)
Dimensions (W*D*H)	1,050*1,350*2,400 (mm)
Weight	2800kg
Compliance	UN38.3, IEC61619, UL1973, UL9540 and CE-EMC

Liquid-cooled Battery Cabinet

ECO-B372LS

Brief

The liquid-cooled battery cabinet adopts advanced cabinet-level liquid cooling and temperature balancing strategy. The cell temperature difference is less than 3°C, which further improves the consistency of cell temperature and extends the battery life. The modular design makes the parallel solution more flexible and can be combined with the centralized PCS to form an ESS with higher energy density, which significantly improves the economy, safety and construction convenience of ESS projects.



Features

Compact
Less footprint compared with air-cooled unit of same energy level.

High Power Density
372kWh energy in one cabinet and ensure long-term endurance.

Efficient
Optimal in-PACK duct design, achieve high-efficient cooling and low energy consumption

Long Cycle Life
Over 8,000 times cycle life, excellent performance of battery system.

Flexible Expansion
Modular design, simplified parallel expansion.

Ultimate safety
In-PACK and triple-level fire safety, prevent heat runaway

Specifications

Item	Specification
Configuration	1P416S
Rated Energy	372kWh
Rated Voltage	1331.2V DC
DC Voltage Range	1165~1498V DC
PACK Ingress Rating	IP65
Rated Charge/Discharge Rate	0.5C
Maximum Charge/Discharge Rate	0.6C (60s)
Operating Temperature	-20°C~55°C
Fire Safety	Combustible gas detection/smoke detection/temperature detection + Active warning + Module-level fire suppression (Perfluoro)
Ingress Rating	IP55
Cooling	Chiller+in-PACK liquid cooling
Altitude	≤2,000m (derating above 2,000m)
Dimensions (W*D*H)	1,300*1,300*2,400 (mm)
Compliance	UN38.3, IEC62619, UL1973, UL9540

All-in-one Air-cooled ESS Container

ECO-E20FT2860WS

Brief

The 20-ft air-cooled ESS container product integrates PACK, BMS, PCS, EMS, HVAC and fire safety system in one container which has advantages such as high energy density, easy transportation, fast installation and high Ingress Rating. With AC output voltage of 690Vac, it can be connected to grid at medium-/high-voltage levels combined with step-up transformation. The 20-ft air-cooled ESS container product can be applied to power generation side, grid side, as well as C&I ESS scenarios which has strict requirements on power and capacity.



Features



Safety and Reliability

High energy density, long service life and reliability with high-quality LFP cells.



Intelligent Temperature Control

The cells temperature difference less than 6°C in the system.



Intelligent Stringing

One-cluster-one-modular-PCS strategy to achieve precise control of cells consistency.



Precise Temperature Control

Each A/C unit corresponds to one battery compartment to consistently and precisely control ventilation of air flow.



Economic and Efficient

Low self energy consumption and high charging/discharging efficiency, supporting various scenarios such as microgrid, backup power, blackstart, demand response.



Intelligent O&M

Triple-level BMS&EMS architecture to achieve real-time monitoring of PACK, PCS, HVAC, fire safety etc., to reduce cost and complexity of O&M

Specifications

DC Part

Battery Type	LFP
Cell Specification	3.2V/280Ah
Grouping	8*1P400S
Rated Energy	2867.2kWh
Voltage Range	1120~1460V
Rated Charge / Discharge Rate	0.5P

AC Part

Rated Power	1433.6kW
Rated Voltage	AC690V
Nominal Frequency	50/60 Hz
PCS Configuration	200kW modular type
Number of PCS	8 units
Isolation Method	Non-transformer isolation
Cooling	Air conditioning cooling

General

Dimensions (W*H*D):	6058*2438*2896mm
Weight	28t
Ingress Rating	IP55
Operating Temperature	-25°C to 55°C (Derating for temperature >45°C)
Humidity	0% to 95% (non-condensing)
Maximum Altitude	2000m (Derating for altitudes >2000m)
Cooling	Forced air cooling with temperature control
Fire Safety	Fire protection with 1230 gas, combustible gas detection + exhaust + fire protection with water
Connectivity	Ethernet
Compliance	PACK: IEC62619, IEC63056, IEC61000, UN38.3 PCS: IEC62477-1, IEC61000

Liquid-cooled Battery Container

ECO-B20FT3720LS



Brief

The 20-ft liquid-cooled ESS container product integrates PACK, EMS, BMS, HVAC, fire safety system into one cabinet. Compared with the air cooling, the liquid cooling empowers the ESS product with higher power density and ensures the temperature difference between the cells within 3°C, which effectively extends battery service life and improves energy efficiency. The 20-ft liquid-cooled ESS container product can be applied to power generation side, grid side, as well as C&I ESS scenarios which has strict requirements on power and capacity.

Product Features



Higher Energy Density

The 20-foot liquid-cooled energy storage container has a maximum capacity of 3.72MWh, providing higher energy density, and saving costs.



Lower Local Power Consumption

The variable-frequency compressor adjusts its operating status based on temperature conditions, thus reducing the equipment's power consumption.



Lower Operating Noise

The product significantly reduces the use of fans, resulting in lower noise compared to air-cooled products.



Longer Service Life

The temperature consistency of battery cell temperatures extends the service life and enhances the safety of batteries, and increases returns.



Better Temperature Control

In comparison to air cooling, the liquid cooling scheme reduces the battery cell temperature difference by 200%, keeping the temperature difference within 3°C.



Higher Protection

The product utilizes the IP54 (PACK IP65) high protection level & C4 protection level and the high/low-temperature design.

Specifications

Item	Specification
Configuration	10P416S
Rated Energy	3.72MWh
Rated Voltage	1331.2V DC
Voltage Range	1165-1498V DC(individual battery 2.8-3.6V DC)
PACK Ingress Rating	IP65
Nominal Charge/Discharge Rate	0.5C
Maximum Charge/Discharge Rate	0.6C (60s)
Operating Temperature	-20°C~55°C
Fire Safety	Perfluoro Fire Safety
Ingress Rating	IP54
Cooling	Chiller+Liquid cooling
Altitude	≤2,000m (derating above 2,000m)
Dimensions (W*D*H)	6,058 mm x 2,438mm x 2,591 mm
Compliance	UN38.3

Air-Cooled PACK

ECO-P1P20WS



Brief

The air-cooled PACK consists of standard 280Ah LFP cells, grouping in 1P20S. With built-in BMU, HV connectors, fans, and fixed structural components, these accessories enable the PACK module to have protection functions such as overvoltage, under-voltage, overcurrent, insulation, short circuit, and overheat. Combined with PCS, it achieves energy charge and discharge. This PACK is compatible with 1500V platform.

Features



Excellent Performance

laser welding for excellent cells consistency and superior charging/discharging performance.



Long Cycle Life

Over 8,000 times cycle life and a designated lifespan of up to 10 years



Safe and Reliable

Optimized ventilation system, active thermal management system.



Flexible Configuration

Standard & modular design, on-demand flexible expansion.

Specifications

ECO-P1P20WS

Cell Type	LFP
Rated Capacity	280Ah
Grouping	1P20S
Rated Energy	17.92kWh (rated conditions)
Rated Voltage	64Vdc
Recommended Operating Voltage	56-72Vdc
Rated Charge/Discharge Rate	0.5P
Cooling	Air Cooling
Cycle Life	≥8,000 times
Storage Environmentt	0~35°C, RH≤95%
Operating Temperature	-25°C~50°C
Ingress Rating	IP20
Dimensions (W*D*H)	470*950*231mm
Weight	135kg
Compliance	UN38.3, IEC61619, UL1973, CE-EMC and UL9540

Liquid-cooled PACK

ECO-P1P52LS



Brief

The liquid-cooled PACK consists of standard 280Ah LFP cells, grouping in 1P52S. With built-in BMU, HV connectors, liquid cooling plate module, fixed structural components, these accessories enable the PACK module to have protection functions such as overvoltage, undervoltage, overcurrent, insulation, short circuit, and overheat. Combined with PCS, it achieves energy charge and discharge.

Features



Excellent Performance

Laser welding for excellent cells consistency and superior charging/discharging performance.



High Integration

High energy density, built-in BMU monitoring the cell status in real-time



Safe and reliable

The cells temperature difference less than 3°C.



Flexible Configuration

Standard & modular design, on-demand flexible expansion.



Long Cycle Life

Over 8,000 times cycle life and a designated lifespan of up to 10 years.



Advanced Protection

IP65 protection level, meeting various scenarios.

Specifications

ECO-P1P52LS

Cell Type	LFP
Rated Capacity	280Ah
Grouping	1P52S
Rated Energy	46.59kWh (rated conditions)
Rated Voltage	166.4Vdc
Recommended Operating Voltage	145.6-187.2Vdc (individual battery cell 2.8-3.6Vdc)
Rated Charge/Discharge Rate	0.5P
Cooling	Liquid Cooling
Cycle Life	≥8,000 times
Storage Environment	0~35°C, RH≤95%
Operating Temperature	-25°C~50°C
Ingress Rating	IP65
Dimensions (W*D*H)	812*1132*238mm
Weight	330kg
Compliance	UN38.3, IEC62619, UL1973, CE-EMC and UL9540

Battery Management System (ECO-BMS)

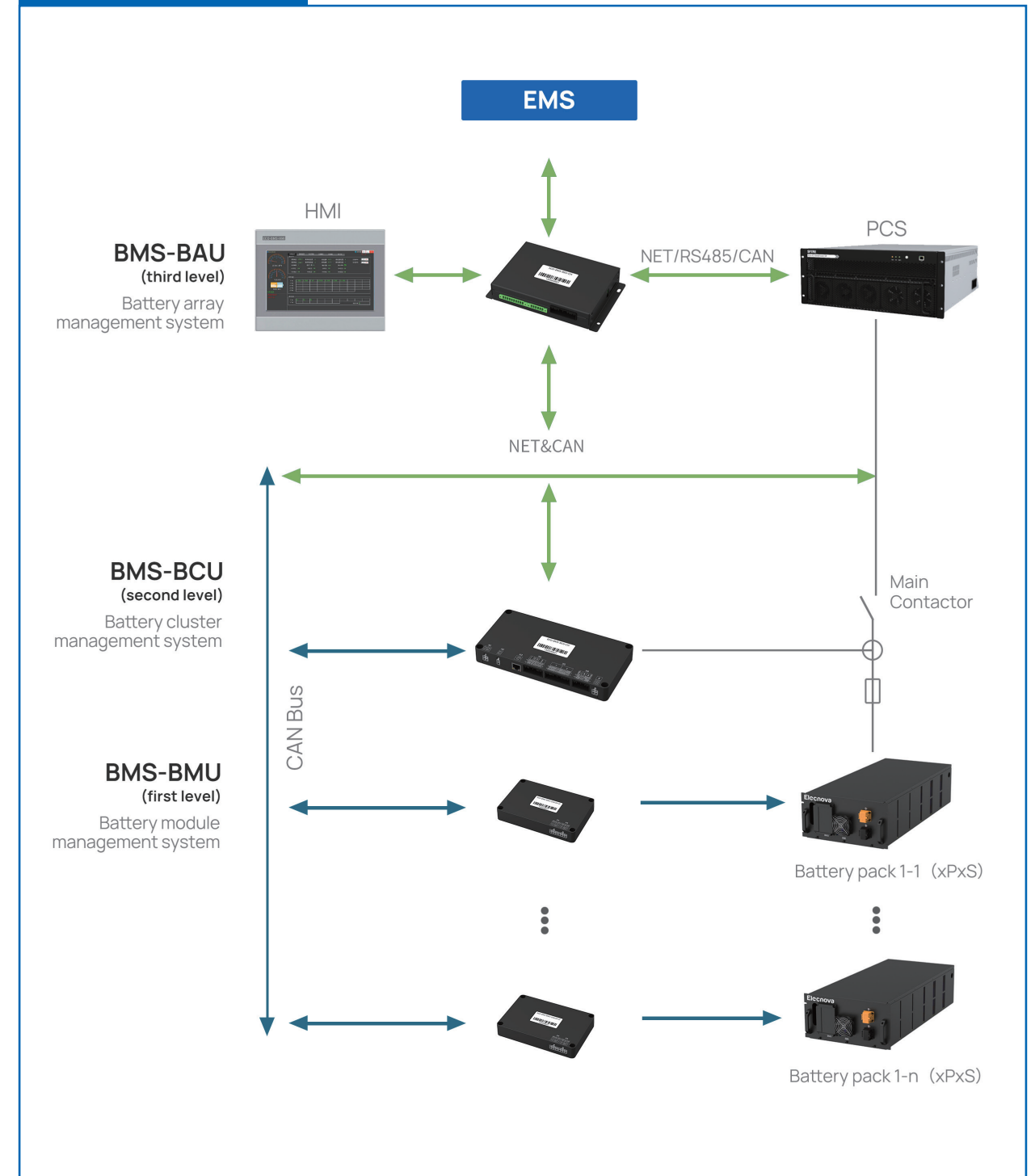
Brief

BMS supports two architectures: three-level architecture (BMU+BCU+BAU) and two-level architecture (BMU+BCU). BMU, BCU and BAU respectively offer PACK-level, cluster-level and array-level protection against overcharging, over-discharging, overcurrent, overheat and short circuit for battery clusters. Real-time monitoring of battery safety status, fault diagnosis, and warnings are provided. The main control unit within the cluster can accurately estimate SOC/SOH (State of Charge/State of Health) and offers insulation detection function with precision requirements exceeding national standards, ensuring efficient, reliable, and safe operation of the energy storage system.

Features

- Complete Architecture**
 Compatible with two-/three-level architectures, support distributed and centralized scenarios.
- High-Precision Insulation Estimation**
 Flexible insulation diagnosis solution, compatible with two-/three-level architectures with high accuracy.
- Multiple Interfaces**
 Multiple types of DI/DO interfaces, adaptive to status input and control of various equipment.
- Various Applications**
 Supports air-/liquid-cooled scenarios.
- Protocol Compatible**
 Support multiple PCS protocols.
- SOC Estimation Accuracy**
 Error < 5%
- Ultra-Low Consumption**
 Flexible power supply and hibernation function.
- Real-Time Response**
 100ms sampling interval to ensure timeliness of data.

Typical Architecture



Specifications (Battery Module Unit ECO-BMS-BMU)



BMU-S24PB-A



BMU-S64PB-A

Functions

- Acquisition of Cell Voltage
- Acquisition of battery temperature
- Module fan PWM speed adjustment
- Passive balancing execution
- Liquid leakage monitoring
- Module fan feedback
- Module fan control

Specifications	Min.	Typical	Max.		Unit
			BMU-S24PB-A	BMU-S64PB-A	
Auxiliary Power Supply	Voltage	9	24	32	V
Operating Environment	Temperature	-25	—	65	°C
	Humidity	5	—	95	%
Cell Voltage	Voltage Range	0	—	5	V
	Sampling channel	—	—	24	64
Voltage Resistance Insulation	Insulation Resistance	—	100	—	MΩ
	Rated Operating Voltage	1500			V
Temperature Sampling	Voltage Resistance	50Hz 3,000VAC applied between voltage sampling terminal and housing and digital interface terminal for 1 minute without breakdown or flashover			
	Temperature Range	-40	—	125	°C
	Sampling Points	—	—	24	64
Passive Balancing	Sampling Accuracy	—	1	—	°C
	Current	—	—	100mA	mA
DI/DO	DI	—	—	2	Channel
	DO	—	—	1	Channel
Signal Wiring	Wiring	—	—	Side connection	—

Specifications (Battery Cluster Unit ECO-BMS-BCU)



Functions

- Total voltage acquisition, main circuit current, insulation resistance and temperature detection
- Control of main circuit contactor and pre-charge relay, as well as status detection of relay
- Communication with sub-control unit for information acquisition of sub-control individual voltage and temperature
- Communication with master control unit to upload battery system information
- Communication with display screen (only for two-level architecture), PCS and EMS to display battery system information
- Passive balancing control algorithm, single cluster SOC/SOH calculation
- Sub-control address allocation control, sub-control fan control, system alarm and protection operations
- System battery data storage
- Multiple digital input/output channels (active/passive)

Main Technical Parameters		Min.	Typical	Max.	Unit
Auxiliary Power Supply	Voltage	9	24	32	V
Operating Environment	Temperature	-25	—	65	°C
	Humidity	5	—	95	%
5V Output			1		Channel
12V Output			1		Channel
Total Voltage Sampling	Voltage Range	100	—	1500	V
	Sampling Accuracy	±0.5			%
Shunt Current Sampling	Current Range	-500	—	500	A
Hall Current Sampling	Sensor Power Supply Voltage	5			V
	Current Range	—	80	—	mA
Insulation Resistance	Detection Range	0	—	10	MΩ
	Rated Operating Voltage	1500			V
Voltage Resistance Insulation	Voltage Resistance	50Hz/3,000VAC applied between voltage sampling terminal and housing and digital interface terminal for 1 minute without breakdown or flashover			
		0	—	3.3	V
AI	Temperature Sampling Accuracy	±1			°C
	DI	8			Channel
DI/DO	DO	8			Channel
	SOC	5			%
CAN	3			Channel	
RS485	3			Channel	
Ethernet	1			Channel	

Specifications (Battery Array Unit BMS-BAU)



Product Functions

- Three-level architecture system management
- Communication with the main control unit to summarize information from the multi-cluster battery system
- Communication with the display screen, PCS and EMS to display all battery system information
- System alarms and protection operations
- Multiple digital input/output channels (active/passive)

Main Technical Parameters		Min.	Typical	Max.	Unit
Auxiliary Power Supply	Voltage	9	24	32	V
Operating Environment Quantity	Temperature	-25	—	65	°C
	Humidity	5	—	95	%
DI	High-level	4 high-level effective inputs			—
	Low-level	4 low-level effective inputs			—
Passive Dry Contact	Normally Open	12			Channel
	Normally Closed	2			Channel
CAN		3			Channel
RS485		5			Channel
Ethernet		1			Channel

Specifications (Human-machine Interface ECO-BMS-HMI)



Product Model	ECO-BMS-HMI-7	ECO-BMS-HMI-10.2
LCD Screen	7" TFT	10.2" TFT
Resolution	800×480	1024×600
Memory	128M	128M
Interface	2 channels serial interface, 2 channels USB Interface	2 channels serial interface, 2 channels USB interface, 1 channel Ethernet interface
Power Supply	24±20%V DC	24±20%V DC
Overall Dimensions	226mm×163mm	271mm×213mm
Hole Dimensions	215mm×152mm	260mm×202mm

Power Conversion System (ECO-PCS)

Brief

This product is a modular inverter specifically designed for small-scale energy storage systems. It achieves bidirectional energy conversion in ESS and can meet the requirements of various scenarios such as C&I ESS, substation energy storage, PV-plus microgrid with ESS.



Features

Ultra-High Efficiency
 GEN7 IGBT, three-level topology and minimal switch loss modulation method, conversion efficiency reaches up to 99%.

Flexible Configuration
 Modular design enables parallel expansion, can directly connect to LV distribution.

Reliable
 IP65 protection level, ms-level on-/off-grid switching.

Versatile Applications
 Extra-wide DC voltage input range, suitable for various battery types and scenarios.

Unique Design
 Adapt to single-/three-phase loads, active/reactive power control capabilities

Excellent load-bearing
 100% three-phase unbalanced loads, strong resistance to load fluctuations.

Specifications

DC Part	ECO-PCS-100/0.4-S	ECO-PCS-100/0.4-T	ECO-PCS-200/0.69-S
Voltage Range	615~950V DC	615~950V DC	1060-1500V DC
Maximum Current	165A	165A	189A
Maximum Voltage	1000V DC	1000V DC	1500V DC
Maximum Power	110kW	110kW	220kW
AC Part			
Rated Power	100kW	100kW	200kW
Max. Power	110kW	110kW	220kW
THDi	<3%	<3%	<3%
Wiring	3P3W	3P4W	3P3W
Nominal Voltage	400V AC	400V AC	690V AC
Power Factor	>0.99	>0.99	>0.99
Power Factor Range	-1 lagging~1 leading	-1 lagging~1 leading	-1 lagging~1 leading
Nominal Frequency	50/60Hz	50/60Hz	50/60Hz
General			
System Efficiency	≥98.2%	≥98.2%	≥98.2%
Switching Time	≤50ms	≤50ms	≤50ms
Connectivity	RS485/CAN	RS485/CAN	RS485/CAN
Ingress Rating	IP20	IP20	IP20
Cooling	Forced Air Cooling	Forced Air Cooling	Forced Air Cooling
Operating Temperature	-30~55 C	-30~55 C	-30~55 C
Humidity	5~95%RH	5~95%RH	5~95%RH
Dimensions (W*H*D)	440*620*225mm	440*620*225 mm	720*640*270 mm
Weight	50kg	50kg	68kg
Compliance		IEC62477-1	

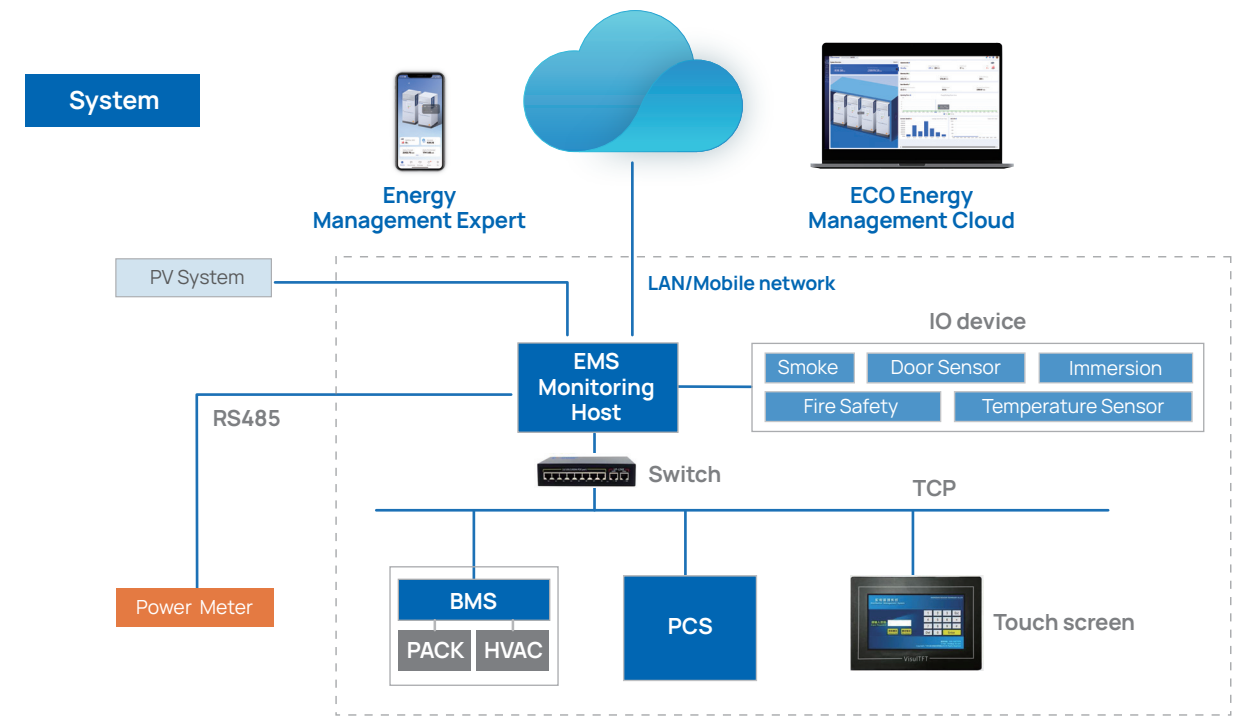
Energy Storage Management System (ECO-EMS)

Brief

The ECO-EMS series products are integrated EMS designed for ESS scenarios, enabling real-time monitoring to meet the requirements of comprehensive operation monitoring, ensuring the safe, reliable, and cost-effective operation of ESS. Adopting an integrated architecture design, the system is suitable for user-side ESS, microgrid and PV-plus ESS and more. It ensures that the system operates optimally at all times, maximizing overall benefits and shortening ROI.

Features

- Smart O&M**
 Support 4G network access to achieve intelligent O&M both on site and cloud.
- Stable and Reliable**
 Bus monitoring and bus wake-up, support the parallel operation of up to 10 integrated units, auto-networking, mutual backup operation between APP and nodes.
- Diverse Integration**
 Support real-time power control, load tracking, demand management, and charge/discharge planning strategies, integrate with distributed power generation equipment, support coordination control of PV-ESS, and distributed consumption and other operation modes.
- Self-adaptive Operation**
 Flexible arrangement of single-/dual-bus during parallel operation, identify the bus operation mode to achieve adaptive operation of multiple units, ensuring the safety of line operation.



Functions

- System Monitoring**
 Real-time monitoring of the operating status of PCS, BMS, air conditioning, access control, fire protection equipment, smoke sensors, immersion sensors, temperature and humidity sensors, and other devices.
- Intelligent Alarms**
 Various notification methods, help customers quickly address operational abnormalities and ensure reliable system operation.
- Peak Shaving**
 Adapt charge and discharge strategies to achieve energy arbitrage.
- Demand Management**
 Smooth the electricity load through charge and discharge strategies, reduce peak power & maximum demand, and lower the customer's electricity cost.
- Time Shifting**
 Intelligent prediction of new energy generation, maximizing the self-consumption utilisation of PV and reducing customer electricity costs.
- Remote O&M**
 Remote fault diagnosis and maintenance, reducing equipment downtime and safety risks, improving operation efficiency, and reducing maintenance costs, ensuring system stability.
- SOH Analysis**
 Collect data such as cell voltage, total current, SOC, and accurately assesses the battery's health status based on cloud.
- PV-ESS Coordination**
 Accurately predict electricity loads and intelligently control the output of PV generation and ESS, improving power supply reliability.